

Performing the same calculation on both sides of an equation will mean that the sides remain equal. This allows us to find the missing number in an equation.

Examples

$$\square + 7 = 19$$

$$\square = 12$$

(-7 from both sides)

$$\square \div 6 = 3$$

$$\square = 18$$

(both sides $\times 6$)

$$4 \times \square - 5 = 23$$

$$4 \times \square = 28 \text{ (+5 both sides)}$$

$$\square = 7 \text{ ($\div 4$ both sides)}$$

In algebra we use letters instead of boxes for missing numbers.

In the following examples form an algebraic equation using x and solve the equation to find the value of x .

- 1 Divide x by 2 and take 5 to give 17.

$$\frac{x}{2} - 5 = 17 \text{ ($\frac{x}{2}$ means $x \div 2$)}$$

$$\frac{x}{2} = 22 \text{ (+5 both sides)}$$

$$x = 44 \text{ ($\times 2$ both sides)}$$

- 2 Multiply x by 3 and add 2 to give 20.

$$3x + 2 = 20 \text{ (3x means 3 times x)}$$

$$3x = 18 \text{ (-2 both sides)}$$

$$x = 6 \text{ ($\div 3$ both sides)}$$

A

Find the missing number.

1 $\square + 4 = 11$

2 $15 + \square = 24$

3 $\square + 0.7 = 1.3$

4 $\square + \frac{2}{3} = 1\frac{1}{3}$

5 $0.48 + \square = 1$

6 $\square - 30 = 26$

7 $\square - 19 = 88$

8 $\square - \frac{4}{5} = 2\frac{1}{5}$

9 $\square - 0.37 = 1\frac{1}{4}$

10 $\square - 0.66 = 9.5$

11 $45 \times \square = 90$

12 $3 \times \square = 24$

13 $0.5 \times \square = 2$

14 $10 \times \square = 1.7$

15 $80 \times \square = 560$

16 $\square \div 3 = 12$

17 $\square \div 5 = 0.8$

18 $\square \div 9 = 30$

19 $\square \div 10 = 0.43$

20 $\square \div 6 = \frac{1}{4}$

Find the number.

- 21 Double this number and add 3 to give an answer of 11.

- 22 Multiply this number by 4 and subtract 7 to give 5.

- 23 Multiply this number by 5 and subtract 3 to give 7.

- 24 Multiply this number by 6 and add 2 to give 20.

- 25 Multiply this number by 3 and subtract 6 to give 9.

- 26 Double this number and subtract 4 to give 12.

B

Find the missing number by forming an algebraic equation and solving it.

1 $3 \times \square + 5 = 11$

2 $9 + 6 \times \square = 51$

3 $10 \times \square - 1.4 = 3.6$

4 $4 \times \square + \frac{3}{5} = 2\frac{1}{5}$

5 $7 \times \square + 0.8 = 6.4$

6 $8 = 3 \times \square - 7$

7 $50 = 6 \times \square + 2$

8 $32 = 10 + 2 \times \square$

9 $2\frac{1}{2} = \frac{3}{4} + 7 \times \square$

10 $2 = 5 \times \square - 0.5$

11 $\square \div 2 + 11 = 26$

12 $\square \div 10 - 1.4 = 2.4$

13 $\square \div 6 + 8 = 17$

14 $\square \div 7 - 29 = 6$

15 $\square \div 4 + 0.25 = 1$

16 $2 = \square \div 3 - \frac{2}{3}$

17 $8 = \square \div 9 + 4$

18 $20 = \square \div 12 + 9$

19 $0.6 = \square \div 5 - 0.3$

20 $0 = \square \div 8 - 12$

Form an equation and find the value of x .

- 21 Multiply x by 5 and add 4 to give 19.

- 22 Double x and subtract 6 to give 8.

- 23 Multiply x by 7 and subtract 15 to give 13.

- 24 Divide x by 3 and subtract 7 to give 5.

- 25 Multiply x by 9 and subtract 11 to give 7.

- 26 Divide x by 4 and add 10 to give 16.

- 27 Multiply x by 4 and add 4 to give 100.

C

Solve the equation.

1 $4x + 2 = 30$

2 $3p - 0.6 = 3.9$

3 $8t + 2.8 = 10$

4 $7k + 3 = 45$

5 $12d - 8 = 100$

6 $\frac{m}{4} + 7 = 32$

7 $\frac{c}{6} - 2 = 9$

8 $\frac{z}{10} + 1.7 = 3.3$

9 $\frac{u}{5} - 5 = 7$

10 $\frac{n}{3} + 0.4 = 1$

Find the value of x .

11 $2x + 4 = 4x - 2$

12 $3x - 7 = x + 3$

13 $6x + 10 = 10x + 4$

14 $7x - 2 = 2x + 28$

15 $x + 3 = 4x - 3$

16 $3x + 1 = 2x + 3$

17 $x + 3 = 2x - 1$

18 $5x - 1 = 4x + 2$

19 $3x + 3 = 4x - 4$

20 $x + 6 = 3x - 14$

Form an equation and find the value of x .

- 21 Adding 3 to x gives the same answer as doubling it and subtracting 5.

- 22 Multiplying x by 3 and taking 2 gives the same answer as adding 6 to x .

- 23 Doubling x and adding 5 gives the same answer as multiplying x by 5 and subtracting 4.

- 24 Multiplying x by 10 and subtracting 6 gives the same answer as doubling x and adding 6.

- 25 Multiplying x by 5 and taking 1 gives the same answer as trebling x and adding 3.